Mrs. Hayden

C 5 Extra WS
Geometry 201

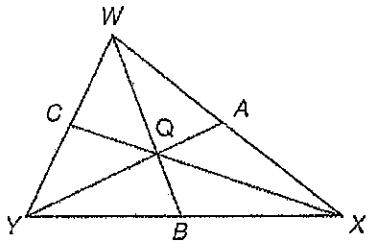
Name Key

1. In $\triangle WXY$, Q is the centroid and $YQ = 2x - 15$ and $QA = 4$. Find x.

$4 = \frac{1}{2}(2x-15)$

$8 = 2x - 15$

$23 = 2x$ $\quad x = 11.5$



2. The vertices of $\triangle QRS$ are $Q(4, 6)$, $R(7, 2)$, and $S(1, 2)$. Find the coordinates of the orthocenter of $\triangle QRS$.

$\overline{QR}$ $m = \frac{6-2}{4-7} = \frac{4}{-3}$

$\perp m \frac{3}{4}$ $(1,2)$

$2 = \frac{3}{4}(1) + b$

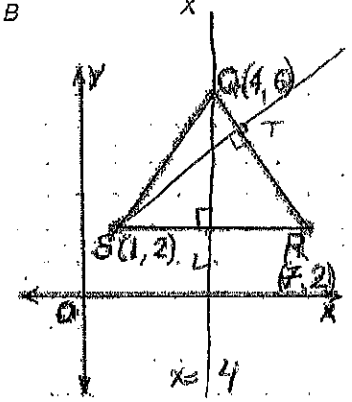
$1\frac{1}{4} = b$

$\begin{cases} y = \frac{3}{4}x + \frac{5}{4} & \text{eqn } \overline{ST} \\ x = 4 & \rightarrow \text{eqn } \overline{QL} \end{cases}$ $(4, 4\frac{1}{4})$

$\frac{3}{4}(4) + \frac{5}{4}$

$\frac{12}{4}$

$y = 4\frac{1}{4}$



not on Test

3. Is it possible to form a triangle with the given side lengths? If not, explain why not.

a. 3 in., 6 in., 8 in. yes

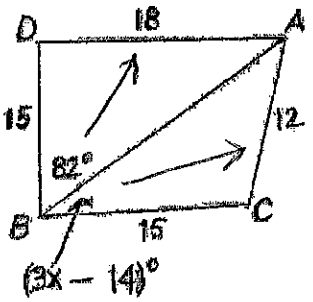
b. 7 m, 9 m, 18 m no $16 < 18$

4. Find the range of possible values for x.

$3x - 14 < 82$ $\quad 3x - 14 > 0$

$3x < 96$ $\quad x > \frac{14}{3}$

$x < 32$ $\quad \frac{14}{3} < x < 32$



5. Write an indirect proof to show that if $3x + 6 < 15$ then $x < 3$.

Given: $3x + 6 < 15$

Prove: $x < 3$

Assume $x \geq 3$

$3(4) + 6$

$18 > 15$

* Contradicts given

Assum $x = 3$

Then $3(3) + 6 = 15$

* Contradicts given

Our assumptions are false $\therefore x < 3$

6. Write an indirect proof to show that if x an odd integer, then x^2 is an odd integer.

Given: x is an odd integer.

Prove: x^2 is an odd integer.

Assume x^2 is an even integer

Then x must be even b/c even x even = even

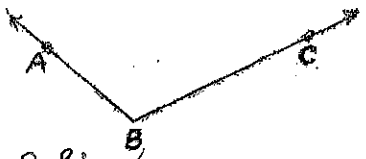
and odd x odd = odd

* Contradicts given, Our Assumption is false.

$\therefore x^2$ is an odd integer

7. Write an indirect proof to show that if $\angle ABC$ is not a right angle then $m\angle ABC \neq 90$.

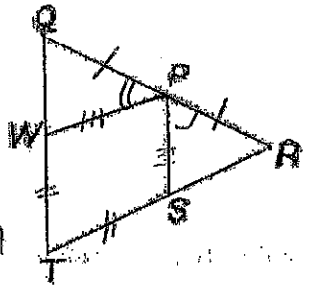
Given: $\angle ABC$ is not a right angle.
Prove: $m\angle ABC \neq 90$



Assume $m\angle ABC = 90$
then $\angle ABC$ is a rt $\angle$ by def of Rt $\angle$
* Contradicts the given our assumption is false
$\therefore m\angle ABC \neq 90$

8. Write a 2 column proof.

Given: **P is the midpoint of $\overline{QR}$**
$m\angle WPQ > m\angle SPR$
$\overline{TW} \cong \overline{TS}$, $\overline{WP} \cong \overline{SP}$
Prove: $TQ > TR$

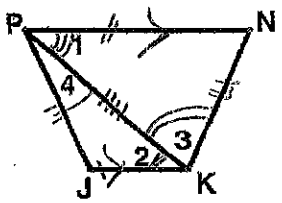


same as one from #6

① ~	① Given
② $\overline{QP} \cong \overline{RP}$	② def of midpt
③ $QW > RS$	③ Hinge Thm
④ $WT \cong TS$	④ def of $\cong$
⑤ $QW+WT > RS+ST$	⑤ Add
⑥ $QW+WT = QT$ $RS+ST = RT$	⑥ SAP
⑦ $QT > RT$	⑦ Subst

9. Write a 2 column proof.

Given: $\overline{PN} \parallel \overline{JK}$
$PN > JK$
$\overline{PJ} \cong \overline{NK}$
Prove: $m\angle JKN > m\angle NPJ$



S	R
① ~	①
② $\overline{PK} \cong \overline{PL}$	② Ref ⊥
③ $m\angle 3 > m\angle 4$	③ Conv. of Hinge
④ $\angle 1 \cong \angle 2$	④ AIA Int $\angle$s Thm
⑤ $m\angle 1 = m\angle 2$	⑤ def of $\cong$
⑥ $m\angle 3+m\angle 2 > m\angle 4+m\angle 1$	⑥ Add
⑦ $m\angle 3+m\angle 2 = m\angle JKN$ $m\angle 4+m\angle 1 = m\angle NPJ$	⑦ A.R.T.
⑧ $m\angle JKN > m\angle NPJ$	⑧ Subst